Farming in Brittany and Pays de la Loire has a turnover of 10.6 Billion €, it is the first link in the food industry very active in this area. To feed these animals, Brittany and Pays de la Loire (like other European breeding areas) are depending heavily on the import of raw materials rich in proteins. It’s mainly soybeans, about 2.7 million tonnes of meal with fluctuating prices, which have to cover more than ten thousand kilometers and are potential source of GMOs while it contributes to deforestation.

WHAT TO DO THEN?

At the request of Brittany and Pays de la Loire, the Pole Agronomique Ouest built and runs an action plan aiming to move towards greater autonomy for protein for farms in the West of France.

An action plan built around four research axes

**AXIS 1**

**GRAIN**

Pea, lupine, faba bean: the grain crops to produce, especially in combination

**AXIS 2**

**HAY & SILAGE**

*(Milk and Meat Productions)*

Produce hay and silage with a high rate of protein

**AXIS 3**

**OILSEED AND PROTEIN CROPS**

Soybean, sunflower: *(Work in Progress)*

**AXIS 4**

**INCREASED DIGESTIBILITY**

Better use of the proteins produced: *(Work in Progress)*

* source Agreste - Statistique agricole annuelle - Cheptel (effectif en fin d’année 2012)
Setting up of the action plan between Brittany and Pays de la Loire

Methodology

Symposium 2012
« Towards protein self sufficiency in Brittany and Pays de la Loire? »

European Symposium June 2013
"Towards more autonomy protein for european farms: experiences to share"

January 2013
Launch of action by consulted partners:
field actors, cooperatives, farmers’ organizations

c-co-construction of projects with « partners »

✓ Share knowledge of all stakeholders:
farmers, researchers, engineers, technicians

✓ Linked with national activities and developments at the European level
(call ISIB2)

✓ Develop new knowledge collectively.

✓ Turn knowledge into development tools used by farmers and ranchers in west of France.

Currently more than twenty five partners involved
GRAIN: a 5-years project, with a cost of € 3.8 millions

Secure and increase the production of protein grains for livestock in west of France

Pea, lupine, faba bean: 1st choice candidates to increase protein autonomy farms in west of France

**Strong feed potentiality**
- Seeds rich in protein. Average grade: 21% peas, 27% faba bean, 34% lupine
- Also energy source
- Incorporation rate potentially important (35% of ruminant or swine peas, 20% faba bean in poultry)

**Strong agronomic potentiality**
- Plants that do not require nitrogen intake, nitrogen economy of input for the next crop
- Increase wheat yields following pea
- Break cycles of pests, by using legumes in the rotation

**General organization of « GRAIN » project**

**SP1** Know, understand and analyze agricultural practices

**SP2** Experimentations via experimental farms and farms

**SP3** Conduct research work to control diseases on protein crops

**SP4** Conduct research work to control weeds during lupin cultivation

**SP5** Conduct research work to control pests of legumes crops

**SP6** Project Coordination

**SP7** Valuation

In terms of mixed crop

**Partners of « GRAIN » project**

<table>
<thead>
<tr>
<th>Research Teams</th>
<th>Agrocampus Ouest, ESA, INRA, LUBEM, Vegenov</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovation Support Services</td>
<td>CAB-GAB, Chambres régionales d'agriculture de Bretagne et des Pays de la Loire, CUMA Ouest, FREDON, FRAB-GAB, RAD</td>
</tr>
<tr>
<td>Cooperatives</td>
<td>Terrena, SA Pinault</td>
</tr>
</tbody>
</table>
Classify the critical points for cultivation of pea, lupine and faba bean for animal feed: survey and practices among farmers.

Unlock the cultivation of protein crops: experiment and test in experimental stations and among farmers.

Diagnose, understand and propose solutions to the problems of diseases of peas, lupins and faba beans.

Optimize the culture of lupine by weed control: study the interactions induced by lupine associations with other plants.

Studying and monitoring the populations of pests and auxiliaries pea, lupine and faba bean in the context of mixed culture.

Transfer to farmers and ranchers solutions to secure yields of these crops to increase production of legumes in Western France

Some examples of mixed crop:

- Triticale/Pea
- Lupine/Triticale and Lupine/Wheat
- Barley/Pea

Contact: Pôle Agronomique Ouest
Tél: 33 02 23 48 55 51
Mail: Pole.Agro.ouest@agrocampus-ouest.fr
# Self Sufficiency of vegetable protein for cattle (productions of milk or meat)

Hay and Silage: duration 4 years and project total cost 3,4 M€

## Targets to limit imports of vegetable proteins in farms

### Producing more alfalfa - "Luziva project"
- To improve establishment of alfalfa and its production during the first year of cultivation.
- Secure harvesting and conservation
- Evaluation of zootechnical value

### By optimizing the harvest dates of mixed crops - "Fourpro project"
- Mixing cereal - protein crops or using grassland of interest (protein rate)
- Impact of the harvest period on the nitrogen content of forages
- Zootechnical value of harvested crops for feed

### Prevent decline of the productivity of temporary grassland after 4 years cultivation - "Praipe project"
- Develop an observatory of grazed grasslands in western of France
- Test the impact of grazing lines (rest time winter or summer, alternating one mowing, etc.) on the sustainability of a meadow of good forage quality

### Evaluation of maize population (proteine rate) in cattle feed - "QualiMaïsPop project"
- Measure the production of protein per hectare of maize from farmers’ seed
- Value of fodder from these maize populations
- Zootechnical value of silage from maize population

## Partners

<table>
<thead>
<tr>
<th>Research Teams</th>
<th>INRA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovation Support Services</td>
<td>Regional chambers of agriculture in Brittany and Pays de la Loire, Idele, Arvalis, FRAB-GAB, RAD, CUMA Ouest, Experimental farm of Thorigné, Adea, Grapea, cedapa, civam both régions</td>
</tr>
<tr>
<td>Cooperatives and Support Services</td>
<td>Terrena, Coopedom, BCEL Ouest, Eilyps, CLASEL, ECLA et ACE</td>
</tr>
</tbody>
</table>
General organization of the « HAY and SILAGE » project

- Projects led by the Agricultural Professional Organizations
- Rewarding field experience and technical routes from ground to animals,
- Assessing the impact of these technical routes across the farm (economy, working time, etc.)

Network performance farms in terms of autonomy protein for ruminants
Project being developed - Driver: Chamber of Agriculture Mayenne

- mown alfalfa
  Project Luziva
  Driver: Arvalis
- mown hay
  Project Fourpro
  Driver: Chambre d’Agriculture de Bretagne
- grazing
  Project Praipe
  Driver: RAD
- corn
  Project QualiMaïsPop
  Driver: Frab

Simulation of different choices towards protein autonomy
from results of projects: Luziva, Fourpro, Praipe, QualiMaïsPop, Securiprot
Project being developed - Driver: Chamber of Agriculture Mayenne

Three lines of work of the cross "HAY & SILAGE" project:

- Monitor farms, to collect field experience
- Coordinates experiments on livestock, between different projects
- A common assessment of tests, in various projects

All coordinated by the project steering committees and plenary meetings "HAY & SILAGE"

Bovine production in Brittany and Pays de la Loire

- A stable herd in the western France contrary to national decline
- A major economic production of € 3.9 billion
- Many assets (65,000 UTA) and a key geographical coverage
- The upside of a strong presence of animal feeding and agro food industry in western of France

Contact : Pôle Agronomique Ouest
Tél : 02 23 48 55 51
Mail : Pole.Agro.Ouest@agrocampus-ouest.fr